ATTACHMENT 3

Comparison Between Forecasted and Actual Energy Avoided Costs For Pre-1998 DSM Programs and Shared-Savings Earnings Claims

In a May 5, 2003 data request, the four investor-owned utilities (IOUs)[1] were asked to provide a comparison between the energy avoided cost forecasts used to estimate the benefits of their Pre-98 DSM programs, and the actual cost of energy faced by the IOUs in the years following the programs. This comparison was intended to illustrate the accuracy of the energy avoided cost forecasts in predicting actual future energy costs. In sections below, each of the utility's response to the data request is detailed. While the forecasted avoided costs are easily determined through past IOU filings, calculating the actual cost of energy was difficult and thus there are some differences between each IOU's method of calculating those costs.

The *forecasted* avoided costs used to estimate program benefits and shareholder incentives for the Pre-98 DSM programs begin in 1994 and continue beyond the current year. Therefore, the comparison in this data request between the forecasted avoided costs and the actual energy costs runs from 1994-2002. For all four IOUs the source of *actual* electricity energy costs was broken down into three time periods due to the changing mechanism for IOU procurement of electricity over the past 9 years.

For the years 1994-1997, the utilities still owned a majority of the generation facilities used to produce the power they distributed. The actual energy costs calculated for this period are based on the marginal production costs for each utility. For the period 1998-2000, the utilities were procuring all of their marginal energy on the California Power Exchange (PX) and Independent System Operator (ISO) spot markets. The actual energy costs calculated for this period are based on spot prices on these markets. For the period 2000-2002, the IOUs were using power purchased through the ISO day ahead market to cover any system imbalances. The costs for this period were based on the ISO market prices for this period. The basis for the calculation of the actual natural gas costs remained constant over the period 1994-2002, as the mechanism for natural gas procurement has remained constant over that period.

In responding to the data request, all four IOUS state that the actual energy costs provided in the response underestimate the actual avoided costs of the energy saved by their Pre-98 DSM programs. Because the energy saved by DSM programs was avoided and therefore never actually procured, an accurate estimate of the actual avoided costs is not possible. The closest estimate possible is the marginal cost (the last amount of power purchased or generated). The actual marginal cost identifies the last block of energy procured during a given time period. This marginal cost will consistently underestimate the actual avoided cost of the energy saved because were the energy not avoided it would have had to have been procured above the observed marginal cost level.

[1] SCE, SDG&E, PG&E and SoCalGas

Environmental adders and avoided transmission and distribution costs used in the forecasted avoided costs were removed from the original forecasts in order to facilitate an "apples to apples" comparison between forecasted and actual costs of energy. In addition, any transmission and distribution losses were removed to provide a generation-level comparison.

In the sections that follow, the methodologies used by each IOU in calculating the actual energy costs are detailed, as are the results of the comparisons between the forecasted avoided costs and actual energy costs.

PG&E

Electricity

1994-1997:

PG&E system incremental costs (SICs) are presented as the proxy for actual incremental or marginal costs**.** The annual average of the highest daily SICs are used for the actual costs.

1998-2000:

The CPUC required PG&E to transact exclusively through the PX (as PG&E's Scheduling Coordinator with the ISO) under the mandatory buy/sell rule. The annual average of the highest daily NP15 Power Exchange (PX) zonal prices for PG&E are used as the proxy for the actual marginal costs for 1998 through June 2000. For the 1998 through June 2000 period, the monthly average PX and ISO market clearing prices were comparable. However, prices in the two markets began to diverge significantly starting in July 2000. PG&E was subject to these ISO prices for customer load that was served by the ISO in its real time market. Accordingly, for the July through December 2000 period, PG&E used the annual average of the daily highest ISO ex-post prices for the actual average costs.

2000-2002:

The annual average of the daily highest ISO ex-post prices are used for the actual average costs. As the ISO ex-post prices are not set on a cost of service basis, it is unclear to what extent they recover energy and capacity costs. The ISO ex-post price does not reflect ISO real time prices, out of market purchases, or DWR's contracts. The DWR contracts are much higher than the forecasted avoided cost for 2002 and onward, but because they are unavoidable, the much lower ISO ex-post price was used as the marginal cost.

Natural Gas

1997-2002:

The actual average cost is the actual average cost of all gas purchased regardless of place, and is taken from PG&E's Spot Market Report, to which adopted transmission and distribution rate components are added. Also reported are the highest and lowest prices paid for gas during that season.

SCE

Electricity

1994-1997:

The actual costs are based on the annual average cost of fuel and purchased power, as presented in SCE's Annual Financial and Statistical Reports. These annual average costs were utilized for all time periods in the relevant years, as there is no breakdown available by time period.

1998-2000:

The actual costs are based on the annual average of the highest daily PX price per costing period. The price was developed using the hourly PX Market Clearing Price, which included congestion costs.

2000-2002

The actual costs are based on the imbalance prices for each costing period. The price was developed using the hourly ISO Ex-Post price.

SoCalGas

Natural Gas

1994-2002:

The actual costs are based on the annual weighted average cost of gas for core customers. They are the average of costs delivered to the SoCalGas system, and are comprised of producers' prices and variable transportation charges required for delivery.

SDG&E

Electricity

1994-1997:

SDG&E was not required to maintain historical information and does not have actual marginal data for this time period.

1998-2000:

Actual costs are based on the annual average of the highest daily PX price per costing period.

2000-2002:

Actual costs are based on the annual average of the highest daily imbalance price per costing period.

Natural Gas

1994-2002:

SDG&E was not required to maintain historical information and does not have actual data on natural gas prices to use as a proxy for actual costs.

Summary of Results

Electricity

It should be noted that for each utility there was at least two different avoided cost forecasts developed and adopted by the Commission over the 1994-1998 timeframe. For the comparisons illustrated below, we use the avoided cost forecasts developed and adopted by the Commission in 1994, the first program year for all utilities under the pre-1998 DSM incentive mechanism. PG&E used the adopted 1994 forecast to calculate the net benefits and shareholder incentives for three program years: PY1994, PY1995 and PY1996. SCE used the adopted 1994 avoided cost forecast for PY1994 and PY1995. SDG&E and SoCal each used the adopted 1994 forecasts (one for each utility) for PY1994. While not identical, the differences between the forecasted and the actual costs of energy illustrated in the charts below are similar in pattern to the relationship between forecasted and actual energy costs observed for the other pre-1998 program years, i.e., the forecast adopted for PG&E for 1997 and the forecasts adopted for SDG&E and SCE for 1995 and beyond.

As shown in Charts 1-4, the actual costs of procuring energy for the years 2000 and 2001 were dramatically higher than the utilities' forecasted avoided costs for those years. For the time period prior to 2000/2001, and for the year 2002, the difference between the forecasted and actual cost of energy varied for each utility. However, in no case was the difference (either positive or negative) as significant as the dramatic underestimation of avoided energy costs in 2000 and 2001.

The results for the years other than 2000/2001 can be summarized as follows: For PG&E, the actual cost of energy was lower than the forecasts used for the Pre-1998

program years in all but two costing periods in 1999. (See Chart 1.) For SCE and SDG&E, the actual cost of energy was generally higher than the forecasts. (See Charts 2 and 3.) SCE's forecast for the year 1999 and SDG&E's forecast for the year 2002 were clearly the most accurate in comparison to the actual cost of energy in any individual year. However, as noted above, the avoided cost comparison for SDG&E is limited to the 1998-2002 timeframe due to the lack of actual cost data for 1994-1997.

Natural Gas

SDG&E did not maintain records of the their actual cost of natural gas for the forecasted periods. Therefore, the results discussed below are based on comparisons specific to SoCalGas and PG&E.

As indicated in Charts 4 and 5, the actual costs of natural gas were significantly higher than the forecasted avoided costs in 2000 and 2001, relative to the differences observed over the rest of the forecast period. With SoCal in particular, there was a pronounced change in the difference between the forecasts and the actual costs in these two years. (See Chart 4.) For PG&E, the large increase in the difference between the forecasted and actual costs of natural gas was most pronounced for the high price of gas in the summer and winter of 2001. (See Chart 5.) It should be noted that the forecasted and actual cost comparison is represented differently for the two utilities, due to the difference in data provided. For SoCalGas, the comparison was between the single forecasted avoided cost value for a given year and the average, low, and high actual cost of natural gas for that year. For PG&E the comparison was similar, with the only difference being that the comparison between actual and forecasted values was broken down by winter and summer periods.

General

The comparison between forecasted and avoided costs associated with the pre-1998 program years indicates that, on the whole, the IOU's are not eligible for more benefits than they earned under the shared-savings incentive mechanism adopted in D.94-10-059 for their energy efficiency DSM programs. Rather, it appears that they have received less than 30% of the actual net benefits of these programs, given the forecasting errors associated with their avoided costs forecasts.

Charts

All charts represented below are percentage differences between forecasted avoided costs and actual costs of energy for the forecasted years. Therefore positive values, or values represented by bars above zero, indicate actual costs that are greater than the forecasted costs for that time period. Negative values, or bars below zero, represent actual costs that are less than the forecasted costs for that time period.

The data underlying the charts is based on the utilities' responses to Energy Division's May 5, 2003 data request. The data presented in those responses are appended to this attachment. Information that the utilities requested be kept confidential has been redacted.

Chart 1

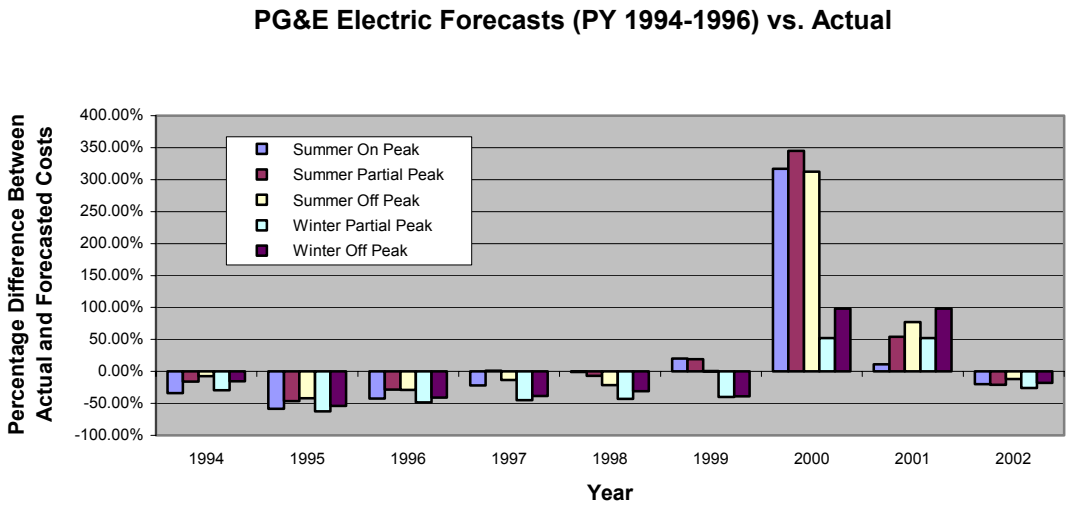


Chart 2

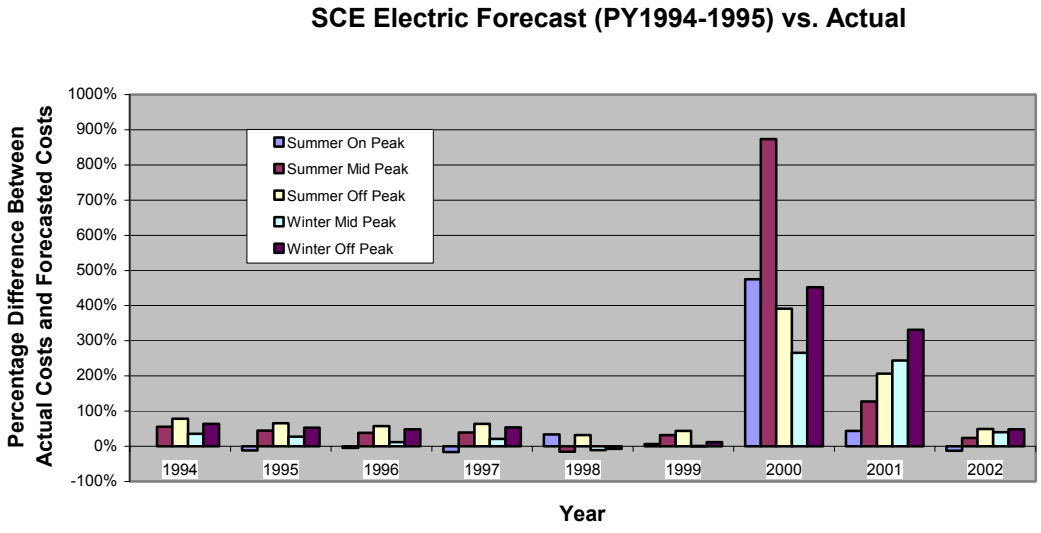


Chart 3

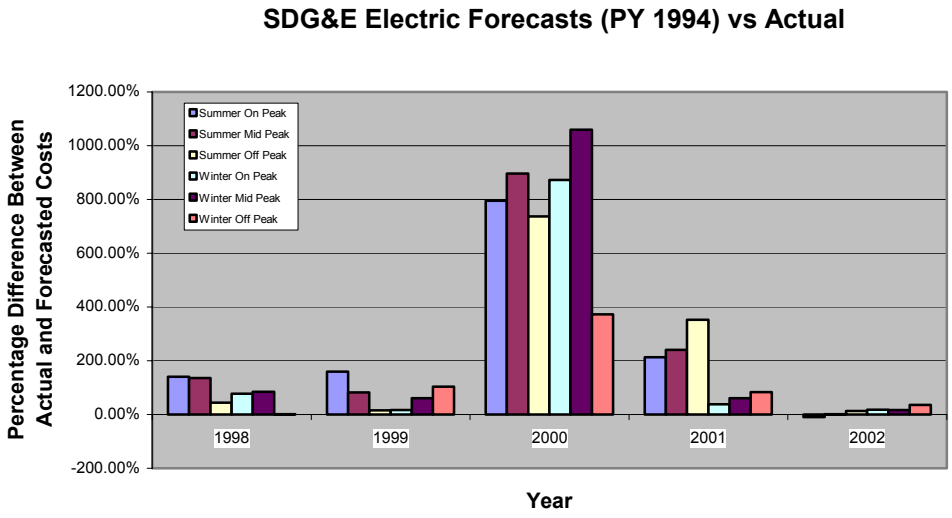


Chart 4

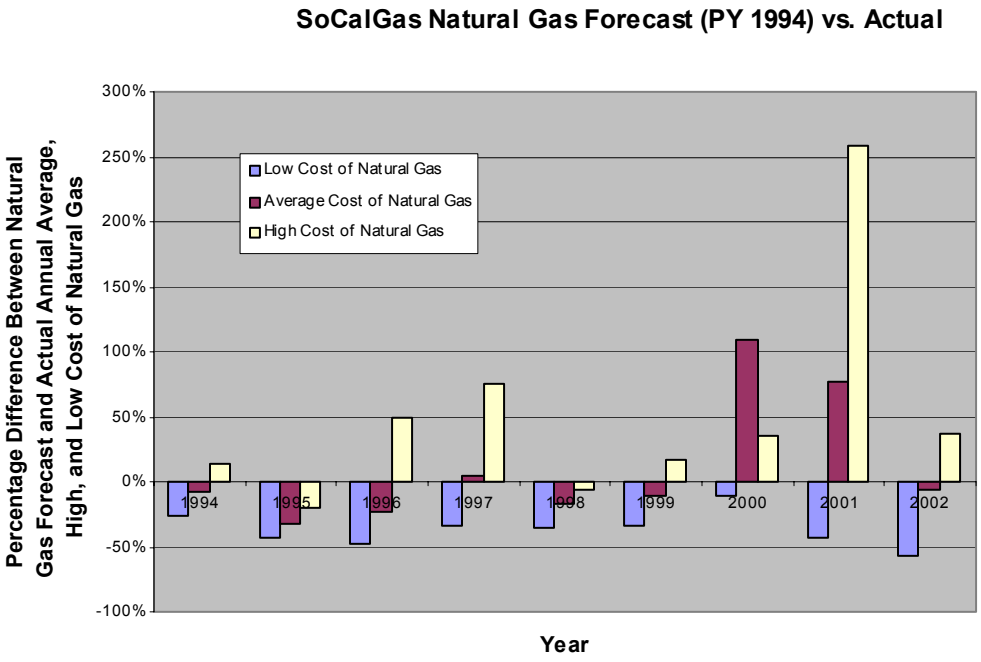
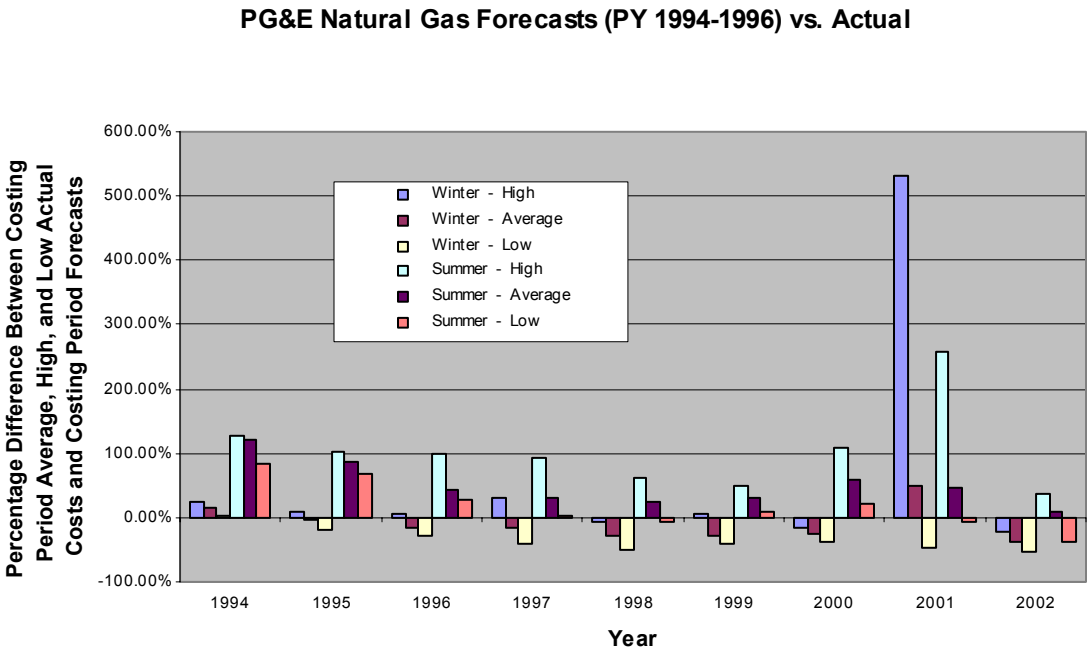


Chart 5


PG&E Natural Gas Forecasts (PY 1994-1996) vs. Actual
Percentage Difference Between Costing Period Average, High, and Low Actual Costs and Costing Period Forecasts
600.00%
500.00%
400.00%
300.00%
200.00%
100.00%
0.00%
-100.00%
Winter - High
Winter - Average
Winter - Low
Summer - High
Summer - Average
Summer - Low
1994
1995
1996
1997
1998
1999
2000
2001
2002
Year